BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
	)	
Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields	)	ET Docket No. 03-137

COMMENTS OF ERICSSON INC. AND SONY ERICSSON MOBILE COMMUNICATIONS INC.

Ericsson Inc. and Sony Ericsson Mobile Communications Inc. (collectively referred to herein for purposes of convenience as "Ericsson") hereby submit comments in response to the Federal Communications Commission's ("FCC" or "Commission") Notice of Proposed Rulemaking, released June 26, 2003, to modify rules regarding human exposure to radiofrequency ("RF") energy from FCC-regulated transmitters and facilities.[1] The Commission is proposing modifications to its current rules to provide for a more efficient, practical, and consistent application of compliance procedures.

Overall, Ericsson believes that the proposals set forth by the Commission will help accomplish its objectives of continuing to protect the public from any potentially adverse effects of RF exposure, while avoiding unnecessary burdens imposed upon licensees and applicants in complying with the Commission's rules. Ericsson does, however, believe that some of the proposed modifications do not go far enough in

[1] *See Notice of Proposed Rulemaking*, ET Docket No. 03-137, Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields, (2003) ("*NPRM*").

relieving certain regulatory burdens that are no longer necessary to protect the public and therefore suggests additional modifications in its comments below.

DISCUSSION

Several years have passed since the Commission first adopted rules to protect the public from the potential harm of RF exposure. Although the concern for public safety remains paramount, much more information is available now than was previously known. As a result, some of the Commission's rules can be modified to relieve licensees and applicants of unnecessary regulatory burdens without increasing the risk of harm to the public. Ericsson encourages the Commission's efforts in this regard and believes that simplified, more efficient, and more consistently applied regulatory procedures for testing RF exposure levels would better serve the industry and the public. With respect to the Commission's specific proposals, Ericsson submits the following comments:[2]

A. Routine Evaluation and Categorical Exclusion of Transmitters, Facilities and Operations

The Commission proposes to change rules regarding routine evaluations, and categorical exclusion from evaluations, of certain transmitting facilities. Specifically, the Commission seeks to modify how the rules deal with accessibility and separation distance.[3] The Commission stresses the importance of considering both total transmitter power and separation distance as well as the consistent application of standards across different types of service.[4] Accordingly, the Commission proposes to: 1) require routine evaluation for fixed transmitting facilities where the separation distance from publicly accessible areas is less than 3 meters, regardless of operating frequency or power, with

[2] For convenience, Ericsson uses the same lettered headings used by the Commission in the *NPRM.*
[3] *NPRM* at ¶ 7.
[4] *Id*. at ¶ 8.

certain exceptions; 2) require routine evaluation for facilities where the separation distance from publicly accessible areas is less than 10 meters and the transmitting power is 100 watts effective radiated power ("ERP") or greater for services operating at frequencies below 1.5 GHz, or 200 watts ERP or greater for services operating at frequencies at 1.5 GHz and above; and 3) categorically exclude fixed transmitting facilities from routine evaluation if the separation distance to publicly accessible areas is 10 meters or greater.[5]

Although Ericsson agrees that both separation distance and total transmitted power should be considered in establishing standards for RF exposure, Ericsson believes that they should not be the sole considerations. In particular, the exposure standards should take into account the antenna height and directivity. In this regard, Ericsson supports the comments and proposal submitted by CTIA and Cingular with respect to categorical exclusions for fixed antennas.[6]

Ericsson also supports the Commission's proposal to categorically exclude certain very low-power transmitters from routine evaluation requirements. Ericsson further believes that operators should be permitted to calculate ERP using antenna gain in

[5] *Id*. at ¶ 11.

[6] It is Ericsson's understanding that both CTIA and Cingular have submitted the following proposal for fixed antennas:

> Part 22H – Cellular -- "Categorically Excluded" if 1) the line-of-sight distance is > 10 meters and the total radiated power is < 4200 watts ERP (6888 watts EIRP); or 2) the antenna is <2 meters above the roof and total power is < 110 watts ERP (180 watts EIRP); or 3) the antenna is > 2 meters above the roof and the total power is < 720 watts ERP (1181 watts EIRP).
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> Part 24E – Broadband PCS – "Categorically Excluded" if 1) the line-of-sight distance is > 10 meters and the total irradiated power is < 7000 watts ERP (11,480 watts EIRP); 2) the antenna is <2 meters above the roof and the total power is <360 watts ERP (590 watts EIRP); or 3) the antenna is > 2 meters above the roof and the total power < 2300 watts ERP (3772 watts EIRP).

different directions. Directional antennas with higher ERP in the main beam may have significantly lower exposure levels behind the antenna that would not warrant routine evaluation. Considering appropriate factors, such as antenna gain patterns of directional antennas, would eliminate burdensome evaluation requirements.

B. Requirements For SAR Evaluation for Certain Section 15.247 Unlicensed Devices

The Commission proposes to require routine evaluation of certain unlicensed Section 15.247 devices that are designed for use within 20 cm of the body, if the "maximum peak output power" of the device exceeds 100 mW.[7] Although Ericsson generally supports this proposal, it believes that "maximum *average* output power," or RMS, is a more appropriate benchmark to use. Calculations of Specific Absorption Rate ("SAR") are made by using average power, as opposed to peak power. Accordingly, average power should be used for purposes of maintaining consistency in SAR calculations. Ericsson also supports the use of the same 100 mW exclusion level for devices operating in the 5 GHz band. Ericsson has found that maximum SAR calculations are similar for 2.45 GHz and 5 GHz WLAN transmitters positioned close to the body.[8] Accordingly, Ericsson believes that it would be appropriate to extend application of the same exclusion level to the 5 GHz band.

C. RF Evaluation Requirements for Transmitter Modules

The Commission seeks comment on possible rules and guidelines for the approval and safe use of modular transmitters while maintaining minimal regulatory burdens.[9] Generally, the Commission proposes to base requirements on power levels of the

[7] *NPRM* at ¶ 18.
[8] *See* "RF Exposure from Short-Range Wireless Communications: A Study of Bluetooth and Wireless LAN," N. Lovehagen, MSc Thesis Report, December 1999, attached hereto as Attachment A.
[9] *NPRM* at ¶ 20.

transmitter modules, combined with the installation configurations and situations for which they would be used.[10] Ericsson supports the categorical exclusion of transmitter modules used in certain identified configurations and exposure conditions that do not exceed 100 mW. As discussed above, Ericsson also proposes that the maximum average output power (RMS) be used as the standard for measurement.

The Commission also seeks comment on whether to allow use of approved modules in additional "host" devices under permissive change rules.[11] If the SAR values, for example, are the same or lower in a new host, no additional filings with the Commission would be required. Ericsson supports this flexible approach to regulation of transmitter modules, as it would eliminate burdensome filing requirements. Along these lines, Ericsson also urges the Commission to apply the permissive change rules in instances where the distance to exposed persons is the same or greater in a different host device.

Radiotransmitters

Ericsson agrees that it is appropriate to specify a low-power threshold for transmission output, below which evaluation should not be required for radiotelephones and other similar devices that are used in close proximity to the head or body. However, Ericsson believes that 2 mW is too conservative, and instead proposes 20 mW as the threshold level. This is the level below which lower-power devices are deemed compliant without testing in the corresponding EU standards.[12]

Ericsson also agrees that modular transmitting devices that operate above 20 mW should require SAR evaluation in combination with a host device, without additional

[10] *Id.* ¶ 21.
[11] *Id.*
[12] *See* EN 50360, EN 50371.

requirements for devices that have already been tested and certified for similar configurations.

Laptop Computers and PDAs

With respect to transmitting modules used in laptops and PDAs, Ericsson believes that the proposed threshold power levels are not consistent and are, in most cases, too low. As a result, testing requirements would be unduly burdensome. A general threshold of 100 mW, as proposed for unlicenced portable devices and modules used in identified configurations, would also be appropriate for laptops and PDAs. This level would significantly ease the burden on manufacturers. To the extent modules cannot be used simultaneously, there should be no limit on the number of modules that can be added without requiring evaluation.

D. Measurement of SAR from Multiple Transmitters

The Commission seeks comment on the appropriate method of evaluating SAR when multiple transmitters are used in a single device.[13] Ericsson agrees with the Commission that, in most cases, simply adding together the SAR values of the individual transmitters would result in an overestimation of the actual SAR for the device. Although such a method may be convenient to administer, Ericsson believes that a more accurate method of estimating SAR values is available.

In particular, Ericsson believes that an approach that utilizes SAR distributions for the different transmitters is a more accurate measure of SAR values. With this method, the SAR for the transmitters in the device is measured separately, the measured SAR distributions are added, and then the maximum 1 g and 10 g mass averaged SAR from the resulting distribution is calculated. This method has been successfully tested on a

[13] *NPRM* at ¶ 31.

number of devices, and the results have been published in a conference paper by Ericsson.[14]

Ericsson believes that this method is a more accurate measure of SAR values for multiple transmitters in a single device. In addition, test procedures based on the Ericsson paper have been incorporated into the draft international SAR measurement standard from the International Electrotechnical Commission ("IEC"). Accordingly, Ericsson urges the Commission to adopt this method as an acceptable procedure for measuring SAR values for multiple transmitters in a single device.

E. Reference to OET Bulletin 65

Ericsson supports the Commission's proposal to amend its rules to no longer refer to a specific document regarding SAR evaluation for portable devices.[15] As the Commission recognizes, documents and evaluation guidelines can become outdated. Ericsson believes that it is important that the Commission endorse the most appropriate international standards and practices, developed by the IEC, the Institute of Electrical and Electronics Engineers, Inc. ("IEEE"), and the European Committee for Electroctechnical Standardization ("CENELEC"). Accordingly, the Commission's proposal to modify its rules to include a generic reference to Supplement C would allow a more rapid accommodation of updated evaluation guidelines. As the Commission notes, the IEEE has adopted a revised SAR limit for application to the "pinna" of the human ear.[16]

[14] *See* "A SAR Test Procedure for Wireless Devices with Simultaneous Multi-Band Transmission," M. Siegbahn and C. Tornevik, attached hereto as Attachment B.
[15] *NPRM* at ¶ 34.
[16] *Id*. at ¶ 35.

Ericsson supports this revised standard and urges the Commission to adopt the revised SAR limit.[17]

H. Compliance Evaluation Based on SAR Limits

The Commission proposes to modify its rules to include SAR values as a method of determining compliance with RF exposure guidelines, instead of just Maximum Permissible Exposure ("MPE") levels that are expressed in units of power density and field strength.[18] The Commission notes that not including SAR values was an oversight and that, in some instances, reliance upon only MPE values may be inappropriate. Ericsson supports the Commission's proposal to modify its rules on compliance with RF exposure guidelines to allow for evaluation of SAR in lieu of power density or field strength (MPE) evaluation.

I. Spatial Averaging for Evaluating Compliance

The Commission seeks comment on the issue of when spatial averaging of exposure is appropriate and how to deal with localized exposure in situations where spatial peak measurements may exceed the MPE value limits.[19] This has been addressed by IEEE and spatial averaging procedures are described in the IEEE standard C95.3 (2002). Ericsson suggests that the Commission adopt these procedures.

K. Transition Period

Ericsson agrees with the Commission that a transition period is necessary in order for licensees and applicants to become familiar with changes to the Commission's rules.[20]

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[17] In addition, Ericsson notes that the IEEE has recently approved the 1528 standard for SAR evaluation of handheld wireless devices. Ericsson urges the Commission to adopt this as the standard practice as expeditiously as possible. Similarly, the IEC is developing a standard for SAR testing of certain radio products, which Ericsson urges the Commission to consider and adopt.
[18] *NPRM* at ¶ 44.
[19] *Id.* at ¶ 46.
[20] *Id*. at ¶ 49.

Ericsson believes that six months is too short a period of time for implementation of rules that result in *additional* routine evaluations or other regulatory requirements, and that a twelve month transition period is more appropriate. On the other hand, changes to rules that call for simplification or fewer regulatory requirements, such as categorical exclusion from certain requirements, can and should be implemented immediately. In such instances, the resulting ease in regulatory burdens would immediately benefit licensees and applicants.

CONCLUSION

Ericsson shares the Commission's concerns with protecting the public from the potential risks of harmful levels of RF exposure. At the same time, Ericsson commends the Commission in recognizing that regulatory burdens for licensees and applicants can be eased. Ericsson believes that the proposed changes to the Commission's RF testing requirements, after taking the foregoing comments into consideration, would strike the appropriate balance between public safety and efficient regulation.

Respectfully submitted this 8th day of December, 2003.

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